

REMARKS/ARGUMENTS

Reconsideration is respectfully requested of the Official Action of July 25, 2007, relating to the above-identified application.

A one-month extension of time, together with the associated fee, is filed herewith.

With the foregoing amendment, the claims have been extensively revised in order to place them in better form in accordance with U.S. patent practice. New Claims 8-13 are presented to even more clearly point out the present invention.

Claims 2-7 stand withdrawn from further consideration. New Claim 8 is presented as a product-by-process claim and is a "linking" claim which links the product of Claim 1 with the process of Claims 2-7 and with the subject matter of new Claims 9-13. Accordingly, with the presence of this linking claim, applicants respectfully request that Claims 2 to 13 be examined, together with Claim 1.

A new Abstract is presented herewith on a separate sheet of paper.

The rejection of Claim 1 under 35 U.S.C. § 112 (second paragraph) is traversed and reconsideration is respectfully requested. Claim 1 has been amended to make clear that the "dimensions" referred to in the claims are the dimensions of the article and that they are equal to or lower than 500 μm .

With regard to the term "isotropy", that term as used herein means the optical isotropy. The definition from Wikipedia is enclosed herewith to complete the record. The dimensions

referred to mean the geometrical dimensions which indicates that the optical article as defined in Claim 1 has two primary features; namely, essentially complete isotropy and dimensions equal to or lower than 500 μm .

The rejection of Claim 1 under 35 U.S.C. § 102(b) as anticipated by or in the alternative under 35 U.S.C. § 103(a) in view of the International document of *Nogues* (WO 93/21120) is traversed and reconsideration is respectfully requested. The subject matter of the present application relates to a pure silica glass which is formed to make a new mould which is then used to make another new pure silica glass by way of the sol-gel procedure with still further smaller dimensions. It is this process of miniaturization which is repeated several times until there is achieved a point where there is a good copy made of the pure silica optical article and which will no longer be possible to further shrink in dimensions. It is at that point that the physical limitations of the process will be reached.

As reflected in new Claims 8 to 13, the product is made by a sequence of steps which have the aim to miniaturize a specific pure silica glass body. The process starts with a precise mould in which a pure silica glass body is made by way of the sol-gel procedure. The normal shrinkage of the gel in drying produces a first pure silica glass body which is slightly smaller than the mould. This pure silica glass body in turn is used to make another precise mould into which the sol is poured to produce a second pure silica glass body but of yet smaller dimensions than the first pure silica glass body. The cascade of operations is repeated until the pure silica

optical article of the smallest desired dimensions is produced. This cascade of steps, which is set forth in Claim 2 and incorporated into new Claim 8, is explained in Table 1 on page 11 of the application. New process Claims 10 to 13 define the process of this invention in different terminology.

The International publication by *Nogues* discloses a method to produce a glass and ceramic component having "hyperfine features" and dimensions of less than 500 μm by utilizing a sol-gel process; see the Abstract of WO 93/21120.

The process used by *Nogues* as described in his International Publication is the same as shown in US Patent 5,076,980 as is acknowledged on page 3 and page 5, paragraphs 3 and 4, of his International Publication. Example 1 of the *Nogues* International Publication uses the same process as disclosed in Example 1 of the US Patent 5,076,980.

According to the disclosure of *Nogues*, a solution of nitric acid and TMS is added over 3 to 5 minutes and then the solution is cooled. The cooled solution is then cast into a mould where it is maintained until gellation occurs.

In contrast, the present invention utilizes pure silica in a solution of the hydrolyzed TEOS as described in paragraph [0042] of this published application 2006/0181779 A1.

In applicants' process, no boiling was involved and the pH value is changed to 4 and the gellation occurs in 60 minutes. This is described on page 9, line 26. *Nogues* dries the gel by way of xerogel and uses a sequence of low temperature and high humidity treatments.

According to the present invention, the drying is done by way of an aerogel and by the use of an autoclave to produce supercritical conditions.

With respect to the cascade moulding process, *Nogues* mentions the uses of silica glass product characterized by a shrinkage factor of between 0.7 and 0.5 as a new mould to be used in a cascade sequence with its own respective product until the dimensions are shrunk to the desired level.

Applicants' process distinguishes in the following respects from the process of *Nogues*:

First, the making of the master mould, typically metal, through an appropriate high precision mechanical operation so that the average roughness is less than 20 nm.

Second, in a step very different from the first step, the silicon rubber with inverted symmetry and identical dimensions is made.

Third, the replication of the silicon rubber imprint in pure silica is carried out with inverted symmetry and 100% reduced dimension.

This results in the replication of the master mould with identical symmetry and reduced dimensions.

After these three fundamental steps, it is possible to proceed in the cascade process following the periodic sequence of inverting the symmetry by silicon rubber imprint and reducing the dimensions of the imprint by moulding a silica gel replica. These three features are not shown in *Nogues*.

The rejection of Claim 1 under 35 U.S.C. § 102(b) as anticipated, or in the alternative under 35 U.S.C. § 103(a) in view of *Lorenzo*, EP 0 705 797 A2, is traversed and reconsideration is respectfully requested.

The *Lorenzo* patent (EP 0 705 797 A2) discloses optical components to silicon oxide and other mixed metallic oxides having dimensional precision which have a tolerance of surface roughness and profilometric accuracy for visible and ultraviolet spectrum ranges.

Lorenzo fails to show products having the dimensions recited in Claim 1 and no basis has been explained in the Office Action for concluding that those dimensions would be inherent. Accordingly, the Office Action does not establish a proper basis for rejecting Claim 1. Withdrawal of the rejection is respectfully requested.

Respectfully submitted,

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